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The Citrus Industry

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**Citrus Insect Control
For May, 1956**

**Mediterranean Fruit Fly
Invades Lower East Coast**

**Sub-Tropical Fruit Institute,
Lake Placid, May 30-31**

**Quality Citrus Fruits For
European Markets**

**Florida's Orange Exports
Attracts World Attention**

The Problem Of Soil Acidity

**Citrus Growers Form
Rainmaking Organization**

**Sampling Of Infestations
Of Citrus Red Mite**

Don't Do It!

**Transmission Experiments
And Xyloporosis-Cachexia
Relations In Florida**

**Use of DOWICIDE A On Citrus
Fruits Approved By Food
And Drug Adm.**



The Florida Citrus Commission was host to more than 200 community leaders in Boston at the New England Conference on Human Nutrition. Outstanding medical, educational and research experts were on the two-day program designed to get facts about nutrition translated into action in the home and school. Left to right, above, are Dr. L. G. MacDowell, director of research, Florida Citrus Commission, Lakeland; Dr. George R. Cowgill, professor of nutrition, Yale University School of Medicine, moderator of the opening session of the conference; and Marvin H. Walker, member of the Florida Citrus Commission, Lake Wales.

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D-D is the recommended soil fumigant
for control of spreading decline



Before you plant citrus use **D-D** [®] SOIL FUMIGANT

The only way to prevent spreading decline is to clear your soil of nematodes with D-D soil fumigant.

D-D gives you effective control of burrowing nematodes found to be the cause of spreading decline. D-D also controls other harmful nematode species such as: citrus nematode, root knot nematode and meadow nematode. And, D-D prevents resuckering of old root systems that are very often nematode-infested.

D-D soil fumigant is a liquid which is injected into the soil where it becomes a gas which spreads, killing nematodes. D-D is easy to use with conventional gravity flow plow equipment or inexpensive tractor attachment.

Stop spreading decline! Set out your new citrus transplants in nematode-free soil. Before you plant use D-D soil fumigant—available from your insecticide dealer. He will be glad to give you complete information on its application.

SHELL CHEMICAL CORPORATION

AGRICULTURAL CHEMICAL SALES DIVISION

55 Marietta St., N. W., Atlanta 3, Georgia





R. M. Pratt

Citrus Insect Control



R. B. Johnson

For May 1956

W. L. THOMPSON,
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment
Station, Lake Alfred



W. L. Thompson

Purple scale infestations are below the five year average for this time of year and are expected to remain so through May. Red scale infestations on the other hand are a little above average and will increase further in May.

Purple mites were abundant in March and April, and unless there is more rain in May than expected, they will continue to be a problem in May. Six-spotted mite infestations were at an extremely low level through mid-April, at which time an increasing trend began. A peak will be reached about the middle of May, but the level reached will be far below the maximum of last year and the problem will not be general.

Rust mite infestations are low. There will be some increase in activity in May, but a substantial increase is not expected before June.

Mealybug infestations are expected to be low this year.

SPRAY PROGRAM

At the time this article is written the spray program for May is unpredictable. If the dry weather continues, all spraying should be kept to a minimum in non-irrigated groves. However, where there is a heavy scale or mite infestation, control measures should be taken and the safest materials should be used. Even though soil moisture appears to be fairly good, an oil spray or an oil and parathion combination may cause leaf and fruit drop. Oil sprays are also likely to cause oil blotch on oranges where the application is made when the average size of fruit is between $\frac{3}{4}$ inch and $1\frac{1}{2}$ inches in diameter. Grapefruit is not so likely to be marked as oranges. Parathion or malathion sprays may cause some leaf drop, but not so much as oil. Lime-sulfur at 2 gallons per 100 gallons is also somewhat of a shock to

the trees and may cause some old leaves to drop. The safest materials or combinations are wettable sulfur, compounds of neutral copper and zinc, ovotran, aramite, EPN-300, parathion and malathion.

Purple mite injury combined with dry weather may cause heavy leaf drop and mesophyll collapse. Leaf drop is now being reported from heavy purple mite infestations.

Even though six-spotted mite infestations are not general, a few groves

feed is under the button of the fruit, also on the limbs and trunks where egg masses are found.

Purple Mite Control: Ovotran at 1 pound per 100 gallons is effective and this material can be combined with lime-sulfur and other materials used in post-bloom sprays. Aramite and EPN-300 can also be used but should not be combined with lime-sulfur or other alkaline materials. Oil is very effective but its use at this time is limited because of dry weather and

SCALE AND MITE ACTIVITY BY DISTRICTS*

District	Purple Scale	Red Scale	Purple Mite	Rust Mite on leaves
West Coast	4.76	3.67	2.09	1.90
Indian River	4.16	3.36	1.71	1.36
Upper East Coast	4.50	3.25	1.22	.60
Gainesville	4.00	.67	1.50	.60
Orlando	3.91	2.26	1.74	.69
Brooksville	4.49	3.44	2.19	1.33
Ridge	4.39	4.23	2.79	1.21
Bartow	5.55	1.34	1.67	1.56
State Average	4.41	3.25	1.99	1.21
Last Year	4.55	3.09	1.53	.86

* Third week in April. Activity is computed from populations, amount of hatching of scales, and number of groves with increasing or decreasing infestations. Activity is considered high if above 4.0 for purple scale, 3.0 for red scale, and 1.5 for mites.

are heavily infested. Where such is the case, control measures should be taken to prevent drop of new leaves.

Late May is an opportune time to reduce rust mite infestations to a low level so that it will not be necessary to control them when it is time to control scale.

Scale Control: Any scalicide application made in May should not be expected to control scale, especially red scale, throughout the year. Where scale control is necessary, use either parathion, 15% wettable powder at 1 to 1.7 pounds or malathion 3 to 5 pounds per 100 gallons. An oil spray may be used if there is plenty of moisture in the soil and the trees are in a vigorous condition. But, as mentioned above, oil is likely to cause oil blotch on small fruit and it will also prevent degreening of mature Valencia oranges.

Mealybug Control: Mealybug infestations are not general, but where control is necessary, apply 1.7 pounds of parathion per 100 gallons. Make a thorough application on the fruit because one of the favorite places to

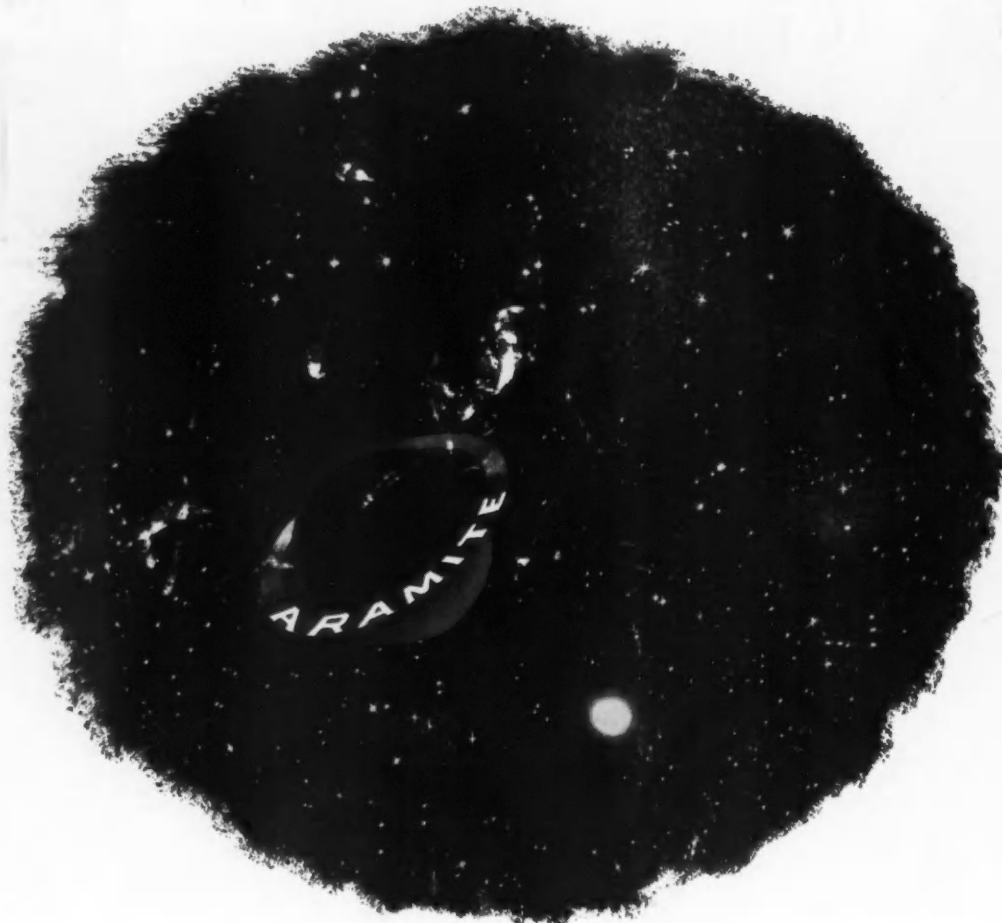
the small sizes of oranges. Where the mature crop is still on the trees, be sure to read the label of the miticide used, for instructions on the waiting period between spraying and picking the fruit.

Six-Spotted Mite Control: Although infestations are not as general as last year, there are some infested groves. These mites can be controlled with the same materials used for purple mite control. Lime-sulfur at 2 gallons per 100 gallons can also be used. Regardless of the miticide used, a thorough coverage of the under surfaces of the leaves is necessary for satisfactory control.

Rust Mite Control: Lime-sulfur, 1 gallon, plus 5 pounds of wettable sulfur per 100 gallons is a very effective spray. Ovotran and parathion can be added to the lime-sulfur if purple mite and scale control is necessary. Wettable sulfur, 8 to 10 pounds per 100 gallons, is also effective. During dry weather, sulfur dust is more effective than during rainy weather.

For more detailed information re-
(Continued on page 6)

* Written April 25, 1956. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; T. B. Hallam, Avon Park; and L. M. Sutton, Lake Alfred.



"One in a Million"

All ethical producers and users of agricultural pesticides welcome the passage of the Miller Amendment (Public Law 518).

The establishment of tolerances under the Miller Amendment now sets a limit on how much of any chemical may be permitted to remain on any food crop. Growers who follow label directions for recommended dosage will have no problem with excessive residue.

A tolerance of one part per million has been established on Aramite by the Food and Drug Administration under the provisions of the Miller Act for its use

on food crops. This simply means that when used according to label recommendations no more than one part per million remains on such food crops. Aramite is potent and yet the residue will be well below the legal tolerance allowed.

Aramite is being used in your mite control program in increasing quantities year after year, to protect valuable food and non-food crops against mite depredations. Its dependability on a wide range of crops is unsurpassed by any other mite killer.

Truly...Aramite is "One in a Million".



United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

producers of seed protectants, fungicides, miticides, insecticides, growth retardants, herbicides: Spergon, Phygon, Aramite, Synklor, MH, Alanap, Duraset.



Publication office at Bartow, Florida. Entered as second class matter February 16, 1920, at the post office at Tampa, Florida, under act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

Mediterranean Fruit Fly Invades Lower East Coast

On April 13 Florida citrus growers were alarmed by the announcement that the dreaded Mediterranean fruit fly had been discovered in the outskirts of Miami. After the eradication of the pest in 1929-1930 no Medfly had been found in any section of the United States, and the discovery of the pest in the Miami area came as a distinct and horrifying surprise to citrus growers.

At the time of the 1929-1930 invasion the pest was eradicated at a cost of seven and one-half million dollars, but it required 5000 men, including the National Guard, and eighteen months' time to do the work, and it cost growers additional millions in loss of fruit and trees.

It is the belief of Federal and State authorities that the present invasion is due to the fly having entered the country in the cargo or luggage of airplanes arriving at Miami.

Inadequate Inspection Blamed

Formerly inspection at ports of entry was made on a 100 percent basis, but for some years past "spot" inspection has been the rule. Passengers on ships and airliners objected to the inconvenience of 100 percent inspection, and because the work was expensive the "spot" inspection was substituted. Past and present Plant Commissioners of Florida and other states as well as Federal inspection officials have fought for return of the 100 percent method of inspection, but without result. One Federal official is



ED L. AYERS

STATE PLANT COMMISSIONER

quoted as saying "it is a miracle that it has not happened sooner." Florida Senators and Representatives in Congress are united in the effort to have the 100 percent inspection at ports of entry revived. The "inconvenience" of a dozen or a hundred or a thousand passengers, they say, is of less importance than the introduction of one Medfly or other destructive insect

which may cost millions of dollars to eradicate and cost other millions in the destruction of valuable crops.

The work of eradicating the pest is being directed by State Plant Commissioner Ed. L. Ayers, ably assisted by State and Federal officials and agencies, and with the cooperation of every citrus organization of the State. Citrus experts from Texas, California and Arizona have been brought into the State to aid in the work of eradication, and it is hoped that the pest may be confined to the Lower East Coast section and finally eradicated before affecting other areas of the State.

Since its discovery on April 13, new invasions have been found in Broward county and operations have been extended to that area. Fly traps are being distributed over the citrus belt in every suspected area and bait sprays are being used wherever there seems a possibility of the fly being present.

The Federal government has issued the following announcement:

United States Statement

Finding of the Mediterranean fruit fly, destructive pest of citrus and other fruits and vegetables, in the outskirts of Miami, Fla., April 13 has set off an all-out Federal-State offensive against the insect, the U. S. Department of Agriculture announced last week.

As soon as the insect was tentatively identified as the "Medfly," the State Plant Board of Florida took im-

mediate action to halt movement from the area of any plant material likely to harbor the insect. Scouting of the area was immediately begun.

The main part of the incipient infestation appears confined within a suburban area on the north side of Miami and in Broward county, remote from commercial citrus areas of the State. Fruits grown there are mostly in home yards and gardens. All varieties of fruit in that area in which the larvae could live are being destroyed as rapidly as possible. Property owners have shown fine cooperation in the campaign against the pest.

The citrus industry has responded spontaneously to the emergency by placing at the disposal of Federal-State agencies any of its facilities that might be useful.

"We have sent 2500 traps, used in detecting the presence of the Mexican fruit fly, from Texas to Florida," said Dr. W. L. Popham, director of crops regulatory programs of USDA's Agricultural Research Service. "Eight USDA inspectors experienced in fruit fly control have gone there to operate the traps and to assist in the clean-up work."

Prospects for stamping out the infestation, based on information thus far developed, appear favorable, Dr. Popham believes. Plans now in the making for concerted Federal-State efforts call for destruction of all fruit within the area known to be infested, repeated applications of an insecticidal bait spray to fruit trees and other host plants, and survey in an ever-widening area around Miami.

Plant Commissioner Ed L. Ayers, of the State Plant Board of Florida, Gainesville, has notified interested officials of all States of the finding of the fly. To protect uninfested portions of Florida, the Board will initiate a State quarantine.

The bait spray to be used contains protein nutrients along with an insecticide. It was developed by entomologists, through cooperative USDA-California-Hawaii research, in Hawaii, which is infested with both the Oriental and the Mediterranean fruit flies. In preliminary tests there, the bait sprays effectively controlled the Medfly and other fruit flies at low cost. It is being used against the Mexican fruit fly along the California-Mexico border. Used alone in traps, the protein-nutrient attractant is an efficient survey tool.

The Medfly is one of the world's most destructive fruit pests, attacking citrus and many other fruit and vegetable crops. It destroys millions of

dollars' worth of fruit each year in many sub-tropical regions of the world. The fly punctures the skin of fruit to lay its eggs, and the maggots that hatch feed inside the fruit.

This is the pest's second invasion of Florida. Entomologists found it in parts of 20 counties of central Florida in 1929. It was eradicated in less than two years in one of the hardest-hitting and most successful Federal-State cooperative control efforts in this country's history. At an eradication cost of \$7½ million, American growers have enjoyed 26 years of Medfly-free fruit growing since 1930, and scientists have had time to work out more efficient control measures.

Two methods of treatment of fruit—the vapor-heat process developed during the 1929-30 campaign, and a cold storage treatment first used on a large commercial scale at that time—make it safe to ship fruits from areas infested with the Medfly and other fruit pests into fruit-fly free sections.

A faster, less expensive treatment—fumigation of fruit with ethylene dibromide—holds promise of supplanting these methods.

"The pest has knocked at our doors many times," Dr. Popham revealed. "USDA's plant quarantine inspectors have found and destroyed it in untreated products, especially in travelers' baggage—some 1800 times, at dozens of different ports of entry."

Last year the Medfly was found in Costa Rica—its first known invasion of the North American continent since 1929.

Fruit and Vegetable Association Aids

General Manager of the Florida Fruit and Vegetable Association, Joffre C. David, reported from Washington on steps being taken to combat the menace of the Mediterranean Fruit Fly. David quoted conversations with government officials concerned with the project and said, "The thoroughness with which our Federal and State Agencies have marshalled their resources in only a few hours is reassuring to the fruit and vegetable industry of this State."

"Florida's Senators and Congressmen quickly realized the importance of the situation and secured complete cooperation of the Federal Agencies involved and we are assured that everything that can be done at the national level is being done."

"Such a concerted action may result in confining of the infestation to the immediate area and eradication should be accomplished in a very short time, if experienced personnel

and ample funds are capable of this accomplishment," David added.

Rudolph Mattson, President of the Association, offered the facilities and cooperation of the Association and appointed Luther L. Chandler, Goulds, to represent him in the Dade County Area.

Chandler said, "The people here understand the situation very well and are cooperating wholeheartedly with Government and other interested Agencies."

"The promptness of both Federal and State Agencies in getting men who are experts in this field, immediately on the spot, will unquestionably produce concrete results and we are therefore optimistic about the situation."

At the time of this writing, May 1, officials and workers are hopeful that the fly may be confined to the area now under inspection, but are aware that there is potential danger of spread to other areas.

WILLIAMS BECOMES CHIEF ENTOMOLOGIST NATIONAL PLANT FOOD INSTITUTE

Dr. M. S. Williams, Specialist in Charge, Extension Farm Management and Marketing at North Carolina State College since 1954, will become Chief Economist of the National Plant Food Institute, beginning July 1, Dr. Russell Coleman, Executive Vice President of the Institute has announced.

As Chief Economist for the Institute, Dr. Williams will develop programs designed to focus attention on the economic value of using fertilizers properly.

"We are pleased that Dr. Williams is joining our staff for we recognize the need for closer cooperation with the Nation's agricultural economists, particularly at the land-grant college level, in emphasizing the economic research values of plant foods in relation to the other major factors entering into a sound land management program," Dr. Coleman said.

Dr. Williams received his B.S. and M.S. degrees in Agricultural Economics at North Carolina State College in 1947 and 1949, respectively. He was awarded his doctorate in Agricultural Economics by Purdue University in 1954.

CITRUS INSECT CONTROL FOR MAY, 1956 . . .

(Continued from page 3)

fer to the 1956 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

Sub-Tropical Fruit Institute, Lake Placid, May 30 And 31

CITRUS SECTION

Presiding — Fred P. Lawrence,
Citriculturist, Agricultural Extension Service

9:00 - 9:05 Invocation.

9:05 - 9:15 Welcome to Institute—
K. S. McMullen, Institute Manager.

9:15 - 9:45 "Where Do We Stand
on Spreading Decline" — Hal Jones.

A report on recent developments
in our efforts to combat spreading
decline.

9:45 - 10:15 "New Developments
in Budwood Certification" — Gerald
Norman, Special Inspector, State Plant
Board.

Mr. Norman has just returned from
a tour of California and Texas where
he had the opportunity of studying
their budwood certification programs.
He will give us a report on this trip
plus the recent development in our
own program.

10:15 - 10:30 Recess.

10:30 - 11:00 Address — Willard
M. Fifield, Provost for Agriculture,
University of Florida.

11:00 - 11:30 "New Methods and
Techniques in Planting Citrus Trees,"
— Charles D. Kime, Jr., Production
Manager, Waverly Growers.

Mr. Kime's organization is develop-
ing a large track of new citrus groves
and he is here to tell us how they
manage to plant some 2,000 trees
per day.

11:30 - 12:00 "Allocating Produc-
tion Costs" — Zach Savage, Economist
in Charge of Grove Studies, Experi-
ment Station, University of Florida.

Do you know what per cent of your
total cost of operations you can af-
ford to spend on each operation? Zach
will give you some guide posts
that will help you to a more efficient
management program.

12:00 - 1:00 Lunch.

Presiding — Jack T. McCown,
Assistant Horticulturist.

Ag. Extension Service

1:00 - 1:30 "Med Fly In Florida"—
James E. Brogdon, Entomologist, Ag.
Extension Service.

1:30 - 2:00 "Three Years Results
from Using Different Sources and
Rates on Production and Quality of
Marsh Grapefruit" — Dr. Paul Smith,
USDA, Horticultural Station, Orlando,
Florida.

This may well be the information
we have been waiting for!

2:00 - 2:30 "Disease Observations
in the Middle East" — Dr. J. F. L.
Childs, Pathologist, USDA, Orlando.

Dr. Childs has recently returned
from a several months visit in Egypt,
Palestine, and other citrus producing
areas of the world where he went to
observe and advise on citrus disease.

2:30 - 2:45 Recess.

2:45 - 3:15 Lake Alfred.

3:15 - 3:45 Lake Alfred — Dr. W.
L. Thompson.

3:45 - 4:15 Lake Alfred — H. J.
Reitz.

Thursday Morning
May 31, 1956

SUB-TROPICAL SECTION

Presiding — M. U. Mounts

County Agent, Palm Beach County

9:00 - 9:05 Announcements and Re-
marks, K. S. McMullen, Institute
Manager.

9:05 - 9:35 "Fruits for Southern
Florida" — David Sturrock, West
Palm Beach.

Florida is virtually a paradise for
both the professional and amateur
horticulturist. Our wide range of
soils and climate lend themselves to
the successful growing of a wide
variety of colorful and nutritious
fruits. Your speaker will discuss
many of those that can and possibly
should be grown more extensively in
Southern Florida.

9:35 - 10:05 "Lychee Growing on
Hard-pan Soils" — J. H. Popham, Jr.,
Osprey, Florida.

Our lychee industry has, to a de-
gree, been developed on the more
poorly drained soils. Your speaker
has done a rather successful job of
growing lychee trees on those soil
types. He will present an illustrated
talk showing methods of drainage, ir-
rigation and successful management
of lychees on hard-pan soils.

10:05 - 10:20 Recess.

10:20 - 10:50 "Dangers of Irriga-
tion" — William (Bill) Carmichael,
Perrine, Florida.

Although the State Plant Board is
doing the best possible job under ex-
isting regulations — there is still a
great danger of introducing disease
and insects into our state that could
cost our growers of fruits and vege-
tables millions of dollars in crop
loss each year.

10:50 - 11:20 "The USDA Research
Program for Avocados, Mangos, and
Limes" — Dr. Paul L. Harding, Prin-
cipal Plant Pathologist, Bureau of
Plant Industry, Soils and Agricultural
Engineering, A. R. S., Orlando, Fla.

Dr. Harding has done outstanding

research in the field of maturity
studies on Florida citrus fruit. We
have invited him to tell us of the re-
search his department is carrying out
on certain sub-tropical fruits.

11:20 - 11:50 Topic and Speaker to
be announced.

11:50 - 1:15 Lunch.

1:15 - 1:45 "Guava Hybrids and
Their Possibilities" — Dr. George D.
Ruehle, Vice Director-in-Charge, Sub-
Tropical Experiment Station, Home-
stead, Florida.

What are the possibilities of grow-
ing new and improved varieties in
Florida? Much information to answer
this question will be presented, plus
other interesting factors concerning
the culture of this exotic fruit.

1:45 - 2:15 "Propagating Guavas
and Other Subtropicals" — Roy Nel-
son, University of Miami.

For years it was highly impossible
to propagate many of our sub-tropi-
cals by means other than seed, new
techniques now make it possible to
vegetatively propagate many new
varieties.

2:15 - 2:30 Recess.

2:30 - 3:00 "Field Handling of Sub-
tropical Fruits" — C. H. Steffani,
County Agent, Retired, Homestead,
Florida.

Are our containers and harvesting
methods adequate? Much informa-
tion to answer this question will be
covered, plus other interesting facts
and figures on harvesting methods and
the resulting losses from spoilage
and waste as the result of a job poorly
done.

3:00 - 3:30 "Recommended Vari-
eties of Mangos and Avocados" — Dr.
R. Bruce Ledin, or Dr. Ruehle, Sub-
Tropical Experiment Station, Home-
stead, Florida.

What are the desirable characters
of these fruits? Do we have a variety
that adequately possesses these char-
acters?

3:30 - 4:30 "Growing Subtropical
Fruits" — A Panel:

1. Laurence Zill
2. David Sturrock
3. Dr. Geo. Ruehle
4. R. Bruce Ledin
5. M. U. Mounts

Here is your chance to ask those
questions that have been bothering
you — "no holds barred" The above
panel will give you an honest answer
— even if it is "we don't know!"



19% For Young Groves
25% For Old Groves

Do not tamper with these Mighty Fractions

Fertilizer represents an important part in the grower's average acre-crop cost. If you're tempted to skimp on fertilizer quality to save a few dollars, remember that loss of quality and quantity may *cost*, not *save*.

In groves under 10 years old the crop-acre cost averages 19% for fertilizer; in groves over 10 years old it averages 25%. With such a stake in your crop for this one great quality control element, take no chances. Use **IDEAL BRANDS** with **ORGANIC NITROGEN** from high-grade sources... brands laboratory-and-field-tested for balanced, continuous feeding.

IDEAL FERTILIZERS
 NOW AVAILABLE WITH
GENUINE
PERUVIAN
GUANO

Genuine Peruvian Guano is a bird guano collected from the habitat of fish-eating birds, mostly cormorants and boobies, on the coast of Peru. It is a rich source of natural organic nitrogen, phosphoric acid and potash. Also contains a wide variety of essential trace elements. Crop response to Peruvian Guano as a fertilizer is quick, as well as long-lasting. Available again in Ideal Brands.



WILSON & TOOMER
FERTILIZER COMPANY

Plants in Jacksonville, Tampa, Cottendale, Port Everglades
 GENERAL OFFICES • JACKSONVILLE, FLORIDA

Quality Citrus Fruits For Eu- ropean Markets

... By ...

HAROLD T. COOK

Are you selling oranges and grapefruit in European markets? Here are some findings from a recent USDA study which will be of interest to members of the citrus industry exporting citrus fruits to Europe.

Overseas shipping tests with Florida and California citrus fruits showed that a better quality product could be marketed in Europe if the following practices were observed:

1. Select and pack higher quality fruit for export.
2. Precool oranges to below 40°F. as rapidly as possible after packing and protect them from warming on the dock or while loading.
3. Maintain transit temperature of about 35°F. for oranges and from 50° to 55° for grapefruit.

These tests were conducted by the Biological Sciences Branch of AMS in cooperation with the citrus industry in Florida and California, exporters, the Florida Citrus Experiment Station, and USDA's Foreign Agricultural Service. Mr. J. R. Winston was in charge of the tests with Florida fruit. Dr. E. M. Harvey was in charge of the tests with California fruit. They were assisted by W. H. Redit, R. H. Cubbedge and E. P. Atrops were stationed in Europe to examine fruit upon arrival.

Nine test shipments were made with Florida fruit and 6 with California fruit. Five different vessels were used in the 9 Florida tests, and 6 in the California tests. The 11 vessels were representative of the kinds of ships used for transporting citrus fruit to Europe. Some of the ships were relatively old and others were new. All of these ships were able to maintain favorable temperatures if the fruit was pre-cooled to the proper temperature before loading.

Special test boxes of oranges and grapefruit were included with the regular commercial cargoes.

In one of the tests fruit trucked from Florida was loaded at New York. In other Florida tests the fruit was loaded at Fort Pierce or Jacksonville. In all of the California tests the fruit was loaded from Los Angeles. The shipments were unloaded

at Rotterdam, Holland, and Antwerp, Belgium.

Fruit Examined At Destination

Fruit and air temperature records were obtained by clock operated thermographs or electric resistance thermometers. These were placed in test packages or in the air stream at representative places in the cargo compartments. The effect of quality of fruit, packages, treatments, temperature, and other factors on the product at destination was determined by examining the fruit in the test packages and some of the commercial load. This was done when the ship was unloaded and after 1 or 2 weeks in the warehouse.

Findings were the same for Florida and California fruit. Much of the American fruit arrived in good condition. But there also was much room for improvement if American fruit is to compete successfully with fruit from the Mediterranean basin.

Mediocre Quality And Poor Handling

Individual lots in the regular commercial load had excess spoilage and poor appearance. This was largely the result of mediocre quality when shipped, and of poor handling from tree to ship. Such lots were bad for the general reputation of the American fruit. Unfavorable temperatures on the ship also caused some loss in quality. These were not due to faulty ship facilities.

Generally, the condition resulted from too high fruit temperature at loading or the shipper specified the wrong temperatures for the fruit when it was aboard ship.

Most of the oranges from the Mediterranean basin develop a richer and more attractive color than fruit grown in central and south Florida. American fruit for export, to compete successfully in appearance, should be more carefully selected to provide a better than average U. S. No. 1 grade. This can be done by packing fruit with fewer scars and other blemishes. If "color-add" is used it should be applied so as to give an even, attractive color.

Need for Higher Than Average Quality

Fruit for export must be of higher than average quality since it takes 3 to 4 times longer to reach Europe than domestic markets. It was frequently found that some lots of both California and Florida fruit arrived in Europe showing much decay and poor general appearance. Other lots from the same district and shipped in the same compartment had little

(Continued on page 23)

It pays to spray
with *Fasco*



The New PARATHION EMULSION - 8 SHOT PACKAGE



Packed 12 bottles per carton
Two cartons per box
EACH BOTTLE CONTAINS
¾ LB. PARATHION
(Equal to 5 Lbs.
15% Parathion wettable powder)

SAFEST... The safest form of liquid Parathion (for plants) ever developed. Contains no oils—NO insoluble inerts.

CONVENIENT... Especially packaged for both convenience and ease of handling in "shot packages." Twelve bottles per carton; two cartons per box.

ACCURATE... The new "shot package" helps eliminate guess work in measuring.

ECONOMICAL... Highly concentrated; time-saving, labor-saving, money-saving. Each bottle contains ¾ Lb. Parathion. (Equal to 5 Lbs. 15% Parathion wettable powder.)

Correct Iron
Deficiency With
NULLAPON®
NaFe-12
The New
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Florida's Orange Exports Attract World Attention

Certainly the most interesting development in the 1955-56 citrus deal has been the way the exports of oranges to Europe have shown such a steady and substantial increase.

There has been a virtual parade of refrigerated ocean liners from European ports to Fort Pierce, Florida, where the citrus for export is being loaded. Fort Pierce harbor

... By ...
HERB MOSHER

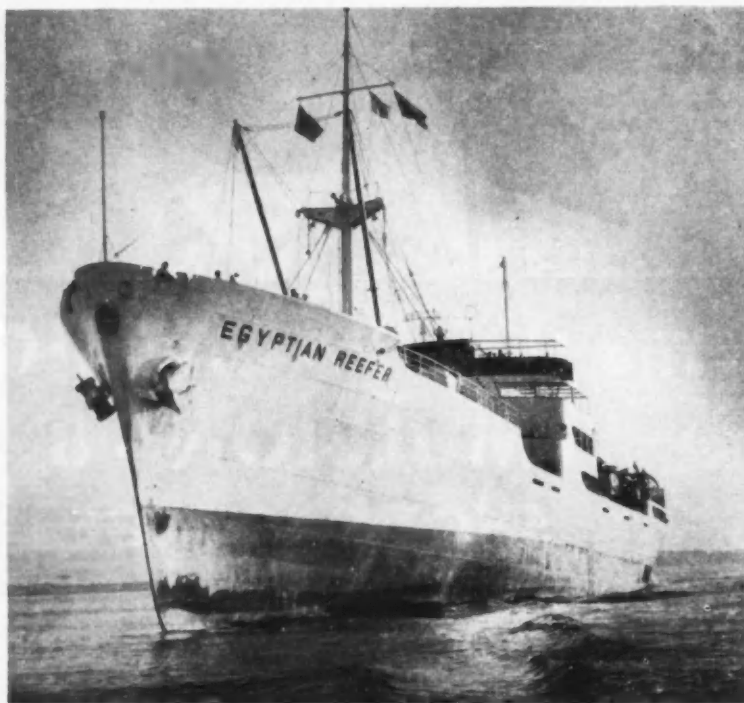
refrigeration company has built for the citrus industry, have watched ships being loaded with 4/5 bu. boxes (already pre-cooled), have listened to

Italian, French, German, Danish and a half-dozen other languages, on the docks or in restaurants, in this cosmopolitan "citrus port," of Fort Pierce. There have been some interesting experiences.

Up to mid-April nine of these big ocean liners had called at Fort Pierce harbor for full cargoes of Florida citrus, including the world's largest boat of the refrigerated type, "La Baule," of French registry. Mr. Conrad Hardie, general manager of the Indian River Refrigeration Terminal Company, says that eight more definitely are booked to call during the balance of the shipping season, with some other boats almost certain to appear.

Almost all of the citrus shipped has been oranges, very little grapefruit having been included in the cargoes. And for some reason not a single box of "river" (Indian River) fruit has been included! Almost unbelievable, this fact that the Indian River shippers are not sending a box of citrus to Europe, out of Fort Pierce harbor.

The exported oranges to date have come mostly from Polk, Orange, Lake, Highlands and Hillsborough counties. Jack M. Berry Exporting Corp. of Winter Haven, and Jac Vandenburg, Inc., of Rotterdam and New York, have been handling the business, via the Indian River Refrigeration Terminal Company. They buy this fruit throughout interior Florida from numerous shippers. The fruit is all paid for when it reaches port for loading on ship for the European markets and there is no waiting, by growers



As THE EGYPTIAN REEFER enters Fort Pierce harbor for cargo of Florida Oranges

has become the center of all this activity, with much more of the same ahead. So during the past couple of months I've spent a whole lot of time in pleasant and busy Fort Pierce, gathering together photos and material for this little story.

On some days I've been fortunate enough to be able to go out to sea with "port pilot," Capt. Walter Egle, in his boat, "Port of Fort Pierce," to meet the ocean liners outside the harbor — so that Capt. Egle could then go aboard and pilot the big ships safely through the inlet channel and on the Indian River Refrigeration Terminal Company's docks where the oranges are loaded.

On other occasions I've looked over the very fine facilities which this



Herb Mosher as he arrives to witness loading of cargo of Florida citrus for European markets

and shippers, for the money. The exporting companies handle all the deals with their European connections.

It is interesting to note that every box of this fruit shipped from Fort

— during the war our harbor was closed to everything but military shipping for security reasons, which drove commercial shipping to other ports — the Fort Pierce port has been of tremendous economic value to the

area.

"It would not be possible to place a definite dollar figure on the savings in freight rates on citrus and other shipments represented by the lower shipping costs made possible only by the availability of the port. But, over a period of years, these savings mount up to a terrific total.

"Local interests have never given up on the possibility of restoring our harbor traffic — and increasing it. The potential is there. This future potential has been imprinted more vigorously than ever upon the public mind by the sizeable movement of citrus fruit to the European markets, due to several bad freezes which curtailed the orange crop in Spain. Practically all of this citrus has moved through our port.

"Currently a firm of nationally recognized industrial engineering firm is making an economic study of the port and its potential. The cost will be in excess of \$25,000. Expensive, but definitely worth while. Private interests are firmly committed to expenditures running into millions of dollars to rehabilitate existing port facilities . . . to add modern storage facilities, and to provide adequate berthing space for large ocean-going

(Continued on page 14)



Conrad Hardie, General manager, Indian River Refrigeration Terminal Co., and John D. Almond, Jr., refrigeration engineer, inspect fruit for export to Europe out of Fort Pierce harbor

Pierce, Florida, to date this season has gone to Continental Europe (none to Britain). The heaviest single cargo moved out on April 5, aboard the big "Panama Express" — 136,340 boxes of oranges, all packed in the new-type brace (wirebound) "export" crate which holds 4/5 bu. Mr. Conrad Hardie of the refrigeration terminal says that total shipments out of Fort Pierce up to April 20th (on nine ships) figured 854,400 boxes, all of these being, of course, 4/5 bu. containers of one kind or another.

Now, in making a study of Fort Pierce harbor, its past history, with emphasis on its future, and what all this means to the citrus industry of the state, I had a discussion with Mr. H. T. Enns, Jr., publisher of the Fort Pierce NEWS-TRIBUNE, one of the fine newspapers in Florida. Mr. Enns assured me that everything possible is being done to improve port facilities, to deepen the inlet channel, turning basin, etc., still more, and to extend docking facilities. Fort Pierce harbor has a great future!

"The Port of Fort Pierce finally seems about to fulfill the dreams of those courageous men who, back in 1929, first saw it opened to ocean-going commerce," he declared.

"Even during the period of relative inactivity following World War II

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Many years a favorite source of soluble magnesia for Florida soils. Used extensively in fertilizer mixtures for citrus crops and vegetables. Especially useful and economical for direct application where only magnesia is required.

Florida growers now consider magnesium a primary plant food in the same category with nitrogen, phosphorus and potash.

The recommendations of the Florida Citrus Experiment Station at Lake Alfred, published in January 1954, stress the need for large application of magnesium for Citrus in soluble form and state that it is usually applied as a Sulphate.

Ask your fertilizer manufacturer for EMJEO, long a dependable source of this key plant food.

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Magnesium

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The Problem Of Soil Acidity

The problem of soil acidity is in reality not a single problem, as the subject implies, but a whole host of problems related to the pH of the soil. However, these problems utilize soil pH as a major diagnostic tool in their solution and, hence, they are often considered as parts of a single problem, soil acidity. Soil types derived from different parent materials, developed under different climatic conditions, and of different textures all have their own well recognized separate and distinct acidity problems. The light textured, poorly buffered soils found primarily in the Coastal Plains area provide some interesting and challenging problems in soil acidity.

Many of these light textured soils are highly productive when heavily fertilized. This use of heavy rates of fertilizer makes it necessary to consider two major forms of acidity on these soils. The permanent or true acidity(1), which may be determined at the end of the rainy season after fertilizer salts have been leached away; and the temporary or fertilizer acidity which is present for varying lengths of time immediately after fertilization.

The permanent acidity, which represents the true equilibrium condition of the soil after soluble fertilizer salts have been leached out, is normally adjusted by calcic lime, dolomite, or hydrated lime to the pH level which has been determined to be most desirable for the crop to be grown. Adjustment of soil pH to the desired level offers no particular problem when the true soil pH is known, since almost every experiment station has published recommendations on the quantities of the various liming materials needed to adjust soils of different textures to desired pH levels. It is most important that the adjustments in acidity be made on the basis of the true soil pH rather than the pH caused by the temporary presence of fertilizer salts. Soil samples taken prior to the end

(1) This is normally measured as soil pH with calcium dominating the soil exchange complex. When sodium and/or potassium dominate the complex higher pH values are obtained. G. M. Volk, Factors Determining the Effect of Various Fertilizer Materials on Acidity in the Soil Profile. Fla. Agri. Exp. Sta., Jour. Series No. 433, Fla. State Hort. Soc. Proc. 68, 1955.



DR. NATHAN GAMMON, JR.,
SOIL CHEMIST, FLORIDA AGRICULTURAL EXPERIMENT
STATION,
GAINESVILLE, FLORIDA

of the cropping season or before the soluble fertilizer salts have been leached, probably should be leached with distilled water to remove these salts before a pH determination is made, or a factor used to compensate for this effect.

The temporary lowering of soil pH by salts such as gypsum has long been recognized, as have the acid producing properties of ammonical forms of nitrogen when applied to the soil. Dunton(2) et al have shown that the addition of dolomite to produce a neutral fertilizer will have little effect on the temporary acidity of the fertilizer. Since the fertilizer acids and acid forming materials initially immobile in the fertilizer band, while the dolomite remains essentially immobile in the fertilizer band.

(2) E. M. Dunton, Jr., D. B. Hall and M. E. Taylor. The Influence of Certain Fertilizing Materials on the Soil Reaction and Nutrient Level in the Potato Row During the Growing Season. Soil Sci. Soc. Am. Proc. 18: 47-53 (1954), also Agrom. Jour. 42: 512 (1950).

The pH of the soil two inches or more away from the fertilizer band was lowered just as much by the neutral as by the acid fertilizer. The end result of the neutral fertilizer, after the crop is removed and the soil is mixed by plowing, is to maintain a slightly higher pH than would be obtained by use of the unneutralized fertilizer. However, neutralized fertilizers seem to have little beneficial effect on the soil pH in the major part of the crop rooting zone during the growth of the crop.

The amount of temporary acidity produced by fertilizers would have little effect on the well buffered soils of heavier texture, but on the poorly buffered sands the application of a ton per acre of 5-10-5 or 6-8-8- may be expected to lower the soil pH in the root zone about 0.5 unit. A drop of 1.0 of pH unit is not uncommon on the lightest soils.

The effect of temporary fertilizer acidity on light textured soils is large enough to move the soil pH well below that considered to be optimum for crop growth. In addition to possible direct adverse effects on plant growth evolving from the temporarily lowered soil pH, indirect effects on the chemical and microbiological activities in the soil may be large enough to reduce the growth and yield of the crop.

For special crops it may be necessary to maintain the true soil pH in the range of 5.0 to 5.5 as in the control of scab on potatoes. Such soils are already below the optimum pH for microbiological conversion of other forms of nitrogen to nitrate. It has been observed that the application of fertilizer to some of these soils may lower the pH sufficiently to practically stop the beneficial action of these nitrifying organisms. In other soils the nitrifying organisms were not completely inhibited at first but the production of additional acidity by the nitrifying processes soon inhibited the activity of these organisms.

Molybdenum availability may be sharply reduced by increased soil acidity. This is the only element in the minor element group that is known to become less available to plants as soil acidity increases. Cauliflower seedlings grown in an acid seedbed (pH 4.5-5.0) may exhibit whiptail (molybdenum deficiency) symptoms in 90 per cent of the plants after they are set in the field, while other plants grown from seedlings

on the same soil but at a pH of 5.5 to 6.0 will be entirely free of whip-tail.

These problems of soil acidity are too complex to lend themselves to simple solutions. In some instances it is possible to raise the initial soil pH by liming high enough to counter-balance the effects of temporary fertilizer acidity. Some correction can be made in the fertilizer itself, particularly through the choice of nitrogen sources whose final reaction is neutral or alkaline. However, much of the temporary soil acidity comes from non-nitrogen containing ingredients of the fertilizer. In this group there is little to choose from in the different materials since the reactions of the various fertilizer salts with the soil colloids to produce a lower soil pH are somewhat similar. Extending our knowledge of what is happening in the rooting zone of our crops will eventually enable us to increase the production of these crops.

Spuds Johnson says digging for facts is better mental exercise than jumping at conclusions.

CITRUS GROWERS FORM RAINMAKING ORGANIZATION

Spotlighted by Florida Citrus Mutual but not officially a part of that organization, a body of Mutual members has organized The Peninsular Water Conservation Association with the idea of employing a firm of rain-makers on an annual basis.

The incorporators are Vernon L. Conner, Mount Dora; Robert W. Rutledge, Lakeland; John Nelson, Umatilla; James Morton, Auburndale, and John T. Lesley, Tampa.

Although all are members of Florida Citrus Mutual, which initiated the rain-making plan, their Peninsular Water Conservation Association is not an official Citrus Mutual project.

Mutual has been considering an industry-wide project, Rutledge, Mutual's general manager, said he had been unable to raise the \$70,000 estimated for a year's experimental operation.

However, the five charter members reported almost 100 per cent backing in Polk, Orange and Lake Counties so that the first stage will be there. The cost for those three counties will be about \$25,000, Rutledge said. If

other areas want to join later, they will be welcomed.

A representative of the Water Resources Development Co., of Denver, Colo., said that weather modification firm would be ready to get to work in about 10 days.

The firm does not guarantee rain, but says it can increase the normal amount of rainfall by seeding rain clouds with silver iodide, usually from ground generators.

Representatives of the Florida Tomato Marketing Committee and the Florida Fruit and Vegetable Association attended the organization meeting.

Tomato growers had expressed alarm at the prospect of unduly heavy rain but the tomato committee voted later to work with citrus men in seeing that a controlled program was carried out.

Rutledge said the new association will be insured against rain damage, and no member will be liable for an amount greater than his investment in the project.

IMPORTERS SAY:

**KEEP 'EM
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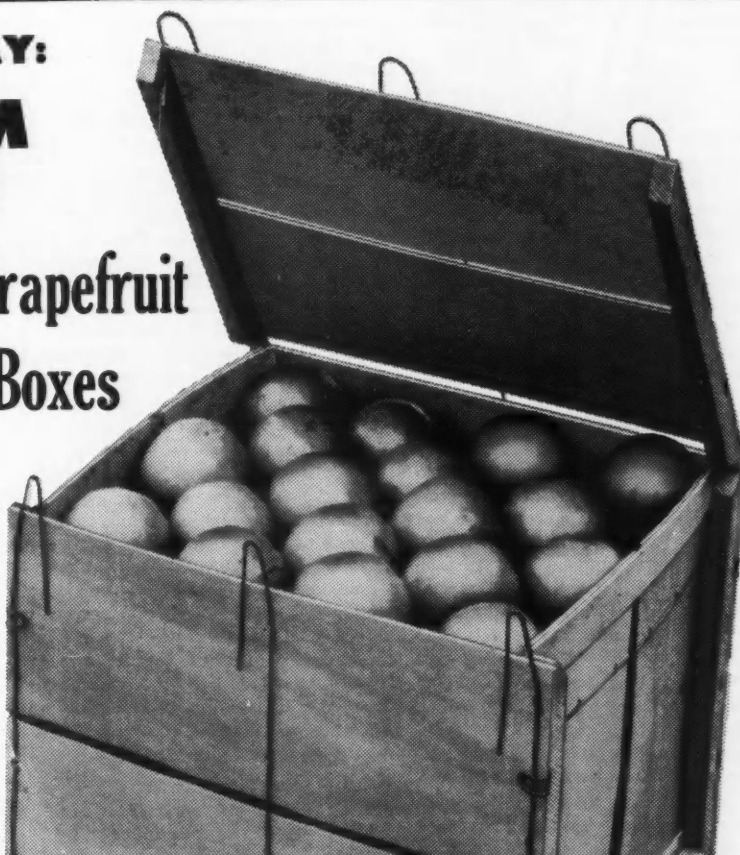
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Sampling Of Infestations Of Citrus Red Mite

The citrus red mite, (1) known generally in Florida as the purple mite, has become a major pest of citrus, especially in the last ten years. Since 1913 the Subtropical Fruit Insects Laboratory at Orlando has conducted many experiments with insecticides and miticides for control of this pest, and also experiments designed to reveal the causes of infestation increases. Sampling methods have been devised to measure natural infestations and also the control obtained with the many treatments that were tested.

Sampling for reliable experimental data is at best a time-consuming and expensive work. Through the years several methods have been tried in a continuing effort to obtain more reliable data at less cost of time and labor, and to find a simple method that might be useful also to citrus growers in checking their own groves.

Experiments involving comparisons of insecticides or miticides for control of red mites are conducted in a single grove of uniform trees to avoid variations between groves. A randomized-block design is used (Spencer and Osburn, 1948). Ten compact blocks of trees are outlined on a map of the grove, each block including a tree for each treatment. By this method all treatments are subjected equally to any variations that may exist between different parts of the grove.

Our present method of estimating infestations has several advantages. We use a hand lens in the grove, and so avoid collection and transportation of samples to the laboratory and use of the microscope. We examine only top surfaces of the leaves, since that is where most of the red mite eggs and crawling stages are found. This is simpler than examining upper and lower leaf surfaces and fruits, and gives larger numbers and less variation for equal time spent.

The hand lens we use is a linen tester with frame having an opening, or field, one inch square. The opening is placed diagonally over the midrib on the upper surface of the leaf, and records are made of the numbers of crawling mites and unhatched viable eggs in the square. This is

HERBERT SPENCER AND



ALLEN G. SELHIME

U. S. DEPT. OF AG. AGRICULTURAL
RESEARCH SERVICE ENTOMO-
LOGY, RESEARCH BRANCH

done for 25 leaves equally spaced around the tree at chest level. Mature, hardened leaves just back of the tender new growth are examined, since tender new-growth leaves may not have been out long enough to develop infestations.

Adding the values recorded for each 25 leaves gives a tree estimate, or index, and adding the indexes of the 10 trees getting the same spray treatment gives the treatment index. This index may be compared directly with other indexes similarly obtained for other treatments, or those found before spraying or later in the year.

The treatment index numbers may be reduced to mites or eggs per square inch if desired, and such indexes may be compared with those obtained in other years in the same grove or in other groves. It is also possible to derive the percentage of leaves infested from the basic leaf records if this is needed for comparison with infestation records so summarized in former years.

Data from infestation estimates made by this new method are better suited for analysis of variance, calculation of experimental errors, and checking adequacy of sample size than data obtained by the percentage method. It is a method capable of showing very small differences in control from different miticides.

There is a decided advantage in recording eggs separately. By doing so one can decide on the probable red mite infestation trends in a grove. If there are fewer unhatched eggs than mites on the leaves, the infesta-

tion is probably declining naturally and spraying or respraying may be avoided. If the mites run more than two per square inch and eggs four or more, a large increase in infestation may be expected in the near future and immediate spraying is advisable. The index of infestation that calls for spraying can probably be set rather closely when additional data becomes available.

A grove owner can adapt the method by examining 25 leaves on each of ten trees well spaced across each grove. One man with a lens and notebook can examine ten acres in an hour and get information that will help him answer the ever-present question, "Shall I spray these trees for red mites now, or wait?" And he can come back ten days after spraying and determine whether or not his efforts have been successful.

References Cited

Spencer, Herbert, and Osburn, Max R. 1948. Randomized-block arrangement for insecticide experiments on citrus trees. Fla. Ent. 31(1): 2-7.

FLORIDA'S ORANGE EXPORTS ATTRACT WORLD ATTENTION

(Continued from page 11)

vessels. This, in turn, will call for deepening the channel well below the present 27 foot project depth.

"Those who have followed the progress of the port over a period of years are confident that the results of this study will more than justify the fulfillment of the private enterprise commitments which have been made," Mr. Enns concluded.

Now, since the full story of citrus exports from Florida to the European markets is simply too lengthy for one issue of the magazine, a report on some other angles, including how the fruit "carries" enroute, where it is marketed, what prices, where consumed, etc., will appear in a second installment, next month.

(To Be Continued)

Americans, as a people, have never learned to love the land and to regard it as an enduring resource. They have seen it only as a field for exploitation and a source of immediate financial return.—H. H. Bennett.

(1) *Metatetranychus citri* (McG.)

NOTES OF THE TRADE

"REGISTERED" IRRIGATION EXPLAINED IN NEW EQUIPMENT

Complete information on "What Registered Shur-Rane Means To You" is contained in a new pamphlet available from the John Bean Division, Food Machinery and Chemical Corp., Lansing, Mich.

The pamphlet discusses in detail the advantages that accrue to farmers, orchardists, and livestock breeders through use of the Shur-Rane irrigation systems. It shows how controlled watering helps increase productivity of fields, and how registration of each system provides the user with maximum benefits and company service.

Each Shur-Rane installation is numbered and all data relevant to the installation — such as plot of the land, water supply sources, climatic conditions, and manpower available — is made part of a permanent record kept on file by the manufacturer. Thus information on each system is always on hand, readily available, should any changes or alterations become necessary. In addition, the Shur-Rane registration system permits the manufacturer to help keep the user abreast of all new developments in irrigation processes and equipment.

Shur-Rane advantages described in detail in the pamphlet include: Shur-Rane design that insures top performance; Shur-Rane technical assistance that provides the user with the latest, most efficient irrigation methods and help on solving special watering problems; Shur-Rane's nationwide distribution that assures fast parts replacements; nationwide financing plan; and standardization of parts to permit low-cost expansion when necessary.

The pamphlet is well illustrated with in-the-field photographs showing Shur-Rane irrigation systems in use in orchards, on row crops, and in permanent pastures.

To obtain a copy, request Pamphlet W-612. These are available by writing to the manufacturer, John Bean Division, Food Machinery & Chemical Corp., Lansing 4, Mich.

Use of water for all purposes in the United States has doubled twice in the last fifty years and is expected to double again in the next twenty-five years.



The Best VEGETABLE Growers Agree . . .

Use Gulf Brands Fertilizer for top dollar at the Farmer's Market

For over 50 years Gulf Fertilizer has helped Florida growers produce top quality vegetables that bring extra dollars at the market.

Continuous research on the needs of Florida soils, and analysis of studies made by field experiment stations, make it possible for Gulf to formulate the right fertilizer for your crops.

Careful manufacturing means each bag contains the right plant food elements — properly weighed and mixed — that are needed to give more growing power to your land.

Order Gulf Brands Fertilizer now! See for yourself why the Best Vegetable Growers use Gulf Brands for better vegetables.



THE GULF FERTILIZER COMPANY

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MORE THAN 53 YEARS SERVICE TO FLORIDA AGRICULTURE

DON'T DO IT!

Don't change your old grapefruit trees over to Orlando tangelo by re-budding or re-grafting. Not that Orlando tangelo isn't an excellent variety; it is. The Orlando tangelo is one of the best tangelo varieties and has brought better than average returns to growers, but topworking it on old trees, grapefruit or any other kind, is asking for trouble. Grapefruit trees are mentioned particularly because many growers are interested in changing grapefruit trees over to other more remunerative kinds of citrus. Topwork with sweet orange varieties, if you wish, but not with the Orlando or other varieties of tangelo.

There is a very good reason for this recommendation: so let us explore it briefly. For years the Orlando and certain other tangelo varieties have been subject to a disease that became known as the Orlando tangelo disease. Subsequently the disease was named cachexia, meaning malnutrition and wasting, due to some chronic constitutional affection. More recently this disease was discovered to be the same as xyloporosis, a disorder previously known in other countries. However, names are not what concern us at this time. The important thing is that this disease is caused by a virus, which like many other viruses, affects some varieties severely and others scarcely at all. The tangelo varieties are injured by xyloporosis, and the Orlando is more severely affected than some of the others. On the other hand, grapefruit and sweet orange varieties may harbor the virus without the grower being aware of it. Therein lies the point of this warning. It is now known that the majority of grapefruit trees and sweet orange trees in Florida are infected with xyloporosis virus. In fact, the odds are better than two to one that any grapefruit tree now growing in Florida is infected with xyloporosis. Such trees have been doing very well for many years, but probably they would be better off without the virus.

When xyloporosis-infected trees are topworked with Orlando or other varieties of tangelo, the virus spreads from the grapefruit tissues into the tangelo tissues. As a result, the Orlando tangelo bark breaks down where it contacts the grapefruit bark, and after a few years, the Orlando branches become girdled, the leaves become yellow, further growth ceases, and fruit production declines. The



J. F. L. CHILDS
PLANT PATHOLOGIST
Horticultural Crops Research Branch,
Agricultural Research Service,
U. S. Dept. of Agri.

some kind of citrus that is not affected by xyloporosis or of replanting with new trees.

Start with young trees, free of xyloporosis, if you want to grow Orlando tangelos, and if you want to change old trees over to a different variety, select one that is not affected by xyloporosis. Sweet orange and grapefruit varieties appear to tolerate xyloporosis very well. Temples and Satsumas are moderately affected, and the better tangelo varieties such as Orlando, Thornton, and Minneola are seriously affected.

MULLER GETS SCROLL FROM GUATEMALA FOR LATIN STUDENT WORK

Prof. Albert S. Muller, adviser to Latin American students in the University of Florida College of Agriculture, was recently awarded a certificate as a distinguished educator at a banquet in his honor given by the Association of Technical Agriculturists in Guatemala.

Seventy percent of all goods sold at retail each year are made up of items coming from the soil.

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Transmission Experiments And Xyloporosis-Cachexia Relations In Florida ...

Introduction

The purpose of this paper is to bring up to date certain information on bud transmission of cachexia, to show the relation of cachexia to xyloporosis as known in Florida and to report some preliminary evidence of seed transmission of the causal agent of xyloporosis.

Cachexia was described on Orlando tangelo (*C. paradisi* x *C. reticulata*) in 1950(1). Experiments on its bud transmission and perpetuation were reported and the striking resemblance to xyloporosis of sweet lime (*C. aurantifolia*) as described in Palestine (9) was discussed (2). More recently it was reported that cachexia is very widely distributed in the citrus varieties formerly and presently grown in Florida and that a very high proportion of the commercial citrus varieties are infected (3, 6).

Symptoms of xyloporosis on sweet lime rootstocks in Florida were reported (4) in 1951. Identification of xyloporosis in Florida was based on the similarity of its symptoms to those of xyloporosis in South America (4). According to Moreira (7, 5) identification of xyloporosis in South America was based on the similarity of its symptoms to those of the Palestine disease. No cross-inoculations were made in either case.

The relation between cachexia of Orlando and xyloporosis of sweet lime in Palestine will not be definitely settled until cross-inoculation studies of the Orlando tangelo and the Palestine form of xyloporosis are made. However, examination of information bearing on this relation is desirable at this time in view of the wide distribution of xyloporosis (cachexia) in Florida (3, 6) and its importance.

It has been observed that certain symptoms of the two diseases are not identical, e. g., that phloem discoloration, which is characteristically pronounced in cachexia-affected Orlando tangelo trees, is not present or is at least much less marked in xyloporosis-affected sweet lime. Also, wood pitting characteristics of xyloporosis has been reported on unbudded seedling sweet lime trees in Palestine, but not unbudded Orlando tangelo seedlings.

Differences in the degree of symp-

J. F. L. CHILDS(1)

tom expression such as phloem discoloration may be the result of differences in varietal response. For example, gum impregnation of the phloem tissues is pronounced in Orlando tangelo, weak in Williams tangelo, and apparently absent in Watt and Webber tanglos infected with the causal agent of cachexia. Varietal differences in symptom expression are also indicated by Olson's observation (8) that symptoms are slower

(1) Pathologist, Horticultural Crops Research Branch, Agricultural Research Service, U. S. Department of Agriculture, Orlando, Florida.

to develop (by two years) in Satsuma mandarin (*C. reticulata*) than in Orlando tangelo. It is of interest that Nocatee tangelo trees, seen by the author in Israel and said to be affected with xyloporosis, exhibited phloem discoloration as pronounced as that exhibited by cachexia-affected Orlando tangelo trees in Florida. Xyloporosis symptoms in unbudded sweet lime seedlings are discussed later in the paper under seed transmission.

In this paper the author uses the term "cachexia" in reference to the Orlando tangelo disease and the term "xyloporosis" in reference to the sweet lime disease, but considers them to be caused by the same virus, or strains of the same virus.

Transmission Experiments

Bud transmission of cachexia: In a previous experiment 3 lots of scions

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Stauffer "Flowable" Parathion 400 is an unusual water-based scalicide, combining Parathion's powerful action with these added benefits —

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Fico 90 oil emulsion has been proved by many commercial growers over many years of use as a highly effective, economical scalicide. Rigid inspection of drums is an *extra* provided by Stauffer to prevent contamination of Fico 90 oil and to prevent troublesome stoppage in spray equipment.

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(21, 16, and 17 respectively) from cachexia-infected Orlando tangelo trees expressed symptoms in 95.3, 86.7, and 94.2 per cent of trees 4 years after budding on Rough lemon (*C. limon*) rootstock (2). In 5 years symptoms expression of these 3 lots was 100 per cent. In contrast, lots (21, 24 and 21 trees, respectively) budded from cachexia-free trees were 100 per cent free of symptoms.

In further recently completed experiments on the bud transmission of cachexia fifteen cachexia-infected Orlando tangelo buds, each from a different tree, were inserted in Orlando tangelo seedlings. Because of the unfavorable weather conditions, all the buds died shortly (1 to 8 weeks) after insertion, but 4 years later 13 of the 15 seedlings expressed bark symptoms of cachexia. At the time 15 cachexia-free buds, each from a different tree, were similarly inserted in Orlando seedlings, and subsequently these buds also died. None of the latter trees developed cachexia symptoms within the 4-year observation period.

In another experiment, single buds from each of five different cachexia-infected Orlando tangelo trees were inserted in five Orlando tangelo seedlings. Subsequently all buds died, but within a 4-year period the five Orlando tangelo seedlings developed bark symptoms of cachexia. Five unbudded seedlings of the same lot developed no symptoms within the same period. Thus as a result of past and recent experience, it seems safe to assume that Orlando tangelo seedlings will develop cachexia symptoms within 2 to 5 years, if cachexia virus is present.

Bud transmission of Florida xyloporosis: Buds from two Hamlin orange (*C. sinensis*) trees and five Temple orange (*C. sinensis* x *C. reticulata*) trees on Florida sweet lime rootstocks affected with xyloporosis were propagated on seven Orlando tangelo seedlings. Subsequently six of the buds died, but the rootstock with the living bud, as well as three of the stocks on which the buds died, developed bark symptoms typical of cachexia. Conversely, 5 buds of cachexia-infected Orlando tangelo were propagated on seedlings of Palestine sweet lime (*C. aurantifolia*) grown from seed from the California Citrus Experiment Station at Riverside. One of these buds died, but all sweet lime stocks developed typical xyloporosis bark symptoms within a 4-year period.

Transmission of cachexia through seed: Fifty Orlando tangelo trees from seed of cachexia-infected parent trees and 50 trees from seed of cachexia-

free Orlando parent trees developed no symptoms within a 4-year period. Of 135 Orlando tangelo seedlings from a commercial source, some unbudded and others budded with cachexia-free buds, none developed cachexia symptoms within a period of 4 to 6 years. However, in one lot of 121 Orlando tangelo seedlings from the same commercial source, 3 seedlings developed mild symptoms suggestive of cachexia infection at the age of 6 years. Whether the causal agent of cachexia was transmitted through the seed or insect or whether root graft transmission occurred is unknown.

As part of another experiment, 30 one-year-old Rough lemon seedlings were obtained from a commercial nursery and set out at the station but not budded. Ten of these trees died, but at the end of 4 years 8 of the remaining 20 trees showed brown-gum-impregnated spots in the phloem of the lower trunk suggestive of cachexia.

Transmission of xyloporosis through seed: Commercial Florida sweet lime seedlings approximately one year old were treated in the nursery row as follows: 10 were budded with cachexia-free Orlando tangelo buds, 10 were inoculated with an actinomycete isolated from citrus roots as part of another experiment not related to cachexia, and 10 were treated as checks on the actinomycete inoculated (i.e., surface sterilized, cut with a sterile knife, wrapped with rubber grafting tape, and coated with a grafting preparation consisting of water-emulsified asphalt). Two months later the seedlings were set out in an experimental planting at the Orlando station. Within 4 years mild symptoms of xyloporosis, wood pitting, and slight discoloration of the phloem, developed in the region of the trunk above the root crown in the following numbers of the sweet lime trees: 5 of the trees budded with cachexia-free Orlando tangelo buds, 7 of the trees inoculated with the actinomycete culture, and 8 of the check trees that were cut in a sterile manner but not


inoculated. Thus of 30 sweet lime seedlings, 20 developed bark symptoms of xyloporosis within the 4-year period.

Summary And Conclusions

Cachexia symptoms have been consistently produced on Orlando tangelo seedlings through inoculation with buds from infected trees (2, 3). Buds from trees on xyloporosis-affected sweet lime rootstock in Florida gave rise to typical cachexia symptoms when propagated on Orlando tangelo seedlings. In the reverse procedure typical xyloporosis symptoms were induced in Palestine sweet lime rootstocks, when they were budded with buds from cachexia-affected Orlando tangelo trees. From these results it appears that the difference between Orlando tangelo and sweet lime in symptom expression may be a matter of differences in host response.


Transmission of the causal agent of cachexia (probably a virus) through the seed of Orlando tangelo is apparently rare if it occurs at all. On the other hand, the causal agent of xyloporosis (probably the same virus) was apparently transmitted through 66 per cent of 30 sweet lime seed. The xyloporosis symptoms noted in Israel (9) on unbudded sweet lime seedlings could be explained on the basis of the present evidence that xyloporosis is transmissible through the seed. Transmission of cachexia through the seed of Rough lemon is believed to be indicated but not fully established. These preliminary results need verification, and such work has been started. The possibility of seed transmission of xyloporosis is of such importance to the citrus budwood certification programs in Florida or elsewhere that the preliminary evidence is reported.

It is obvious that xyloporosis or cachexia cannot be controlled solely through propagating buds free of the virus if seedlings used as rootstocks carry the causal agent of the disease. Also the assumption that citrus nucellar seedlings are a priori disease-



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free may be questioned in the light of the experiments reported.

Literature Cited

1. Childs, J. F. L. 1950. The cachexia disease of Orlando tangelo. Plant Dis. Repr. 34: 295-298.

2. 1952. Cachexia disease, its bud transmission and relation to xyloporosis and to tristeza. Phytopath. 42: 265-268.

3. G. R. Grimm, T. J. Grant, L. C. Knorr, and G. Norman. 1955. The incidence of xyloporosis (cachexia) in certain Florida citrus varieties. Proc. Fla. State Hort. Soc. (in press).

4. DuCharme, E. P., and R. F. Suit. 1951. Xyloporosis of citrus in Florida. Plant Dis. Repr. 556-557.

5. Fawcett, H. S., and A. A. Bitancourt. 1937. Relatorio sobre as doencas dos citrus nos Estados de Pernambuco, Bahia, S. Paulo e Rio Grande do Sul, Rodriguesia anno III. pp. 213-236. (Not seen).

6. Grimm, G. R., T. J. Grant, and J. F. L. Childs. 1955. A bud union abnormally of Rough lemon rootstock with sweet orange scions. Plant Dis. Repr. 39: 810-811.

7. Moreira, C. 1938. Xyloporosis. Hadar, 11: 234-237.

8. Olson, E. O. 1954. Some bark and bud union disorders of mandarin

UNCLE SAM TO CONTINUE HALF THE COST OF CITRUS BUYING DATA . . .

The federal government will continue to pay half the cost for another year of collecting, compiling and analyzing facts and figures about the buying of fresh and processed citrus by the housewife.

Florida Citrus Mutual's general manager, Robert W. Rutledge, has released a letter just received from Omer W. Herrmann, deputy administrator of the agricultural marketing service, U. S. Dept. of Agr., stating: "We have every intention of renew-

ing this agreement for an additional year and have indicated our plans for continuing this work to the citrus and subtropical fruit research and marketing advisory committee."

Mutual recently joined with the Florida Citrus Commission in urging that Uncle Sam continue to pick up the big part of the tab for this consumer purchase data. The government's share is \$50,000, with the citrus commission paying around \$30,000 and the California industry absorbing the rest.

The information is gathered and compiled by Market Research Corporation of America. Mutual told the government it used the information constantly in its economic studies.

"The department has been pleased with the arrangement which has existed in the past," Herrmann's letter stated, "whereby industry has contributed half the contract cost and the department has furnished the balance The purchasing data are apparently widely used and are helpful to the citrus industry in planning long-range marketing programs and in making day-to-day marketing decisions."

The present contract and cooperative agreement runs until Oct. 1 this year.

and mandarin-hybrid rootstocks in Texas citrus plantings. Proc. Amer. Hort. Soc. 63: 131-136.

9. Reichert, I., and J. Perlberger. 1934. Xyloporosis, the new citrus disease. Bull. 12, The Jewish Agency for Palestine Agr. Exp. Sta. Rehoboth pp. 1-50.

(Horticultural Crops Research Branch Agricultural Research Service, U. S. Department of Agriculture, Orlando, Florida.)

(REPRINTED FROM THE PLANT DISEASE REPORTER).

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Reports Of Our Field Men . . .

SOUTH HILLSBOROUGH AND MANATEE COUNTIES

J. D. Toll

Strong winds and continued dry weather, except for about one and one-half inches of rain April 10th, have caused damage to the crops this spring.

Groves, particularly those being irrigated, look good and it won't be long before its time for the summer application of fertilizer.

Tomato growers began picking this week (April 15-21). They are looking forward to a good yield and good quality.

The watermelon crops look fair considering the weather conditions. Most growers expect to begin harvesting within 3 or 4 weeks.

Pastures are dry and most cattlemen are waiting for a good rain before fertilizing their grass.

EAST HILLSBOROUGH AND PASCO COUNTIES

E. A. McCartney

We finally got the rain we hoped for and not too soon. Groves and pastures were in bad shape. Melons were hurt also. Growers could not spray on account of the dry weather. As a result, some groves had heavy leaf drop due to red spider or purple mites as well as dry weather.

One and one-quarter to one and three-quarters inches of rain was the average over this section — a big help — but due to the heavy wind that followed through the rest of the week the soil is drying out and we need more rain before the rainy season starts about June 15th.

Pasco, Hernando and Citrus counties came through in better shape due to the heavy soil. Some growers are fertilizing to try and help their groves out of their weak condition and hoping to get enough rain to put it to work.

HIGHLANDS AND POLK COUNTIES

J. K. Enzor, Jr., & R. E. Lassiter, Jr.

Dry weather has been the primary topic of conversation in this area for at least the last month. On April 10th this area received from one to one-half to 2 inches of rain which was very welcome

and by the 16th groves which had been extremely dry had already begun to show some response to this moisture. However, since this rain, the wind has hardly quit blowing which has definitely been detrimental. So far it looks as though a fairly good crop is being set for another year in spite of the lack of moisture. However, a heavy fruit crop cannot be expected if more rain is not forthcoming.

We have observed six-spotted mites in quite a few groves recently. Although this mite is not expected to cause severe damage this year, growers should be on the lookout.

If the dry weather continues it is expected that this summer fertilizer application will be delayed. However, young trees which are being watered should not be allowed to go too long without receiving fertilizer.

NORTH CENTRAL FLORIDA

V. E. Bourland

We have had hot and dry weather with high winds up until Tuesday, April 10 when we had between one and one and half inches rain followed by high winds which dried ground fast, however, rains helped the situation lots, but irrigation systems are still in use. The rain also helped Valencia and late bloom oranges conditioning them for picking. There still seems to be enough young fruit on the trees in spite of dry weather, most new set trees have had to be watered constantly. The grapefruit situation has not improved, therefore, still a lot of grapefruit on trees and ground. Insects have been quite bad but most growers are aware of that and are taking care of them.

Has been almost too dry for pastures to show much growth.

High winds were very bad on melon fields.

WEST HILLSBOROUGH AND PINELLAS COUNTIES

J. A. Hoffman

A good rain from one to two inches throughout this section on April 10, stopped irrigating pumps that had been running steady for over a month. Altho at this time

the moisture has been used up and irrigation pumps will again be used. Lakes and ponds are about four feet lower than they normally should be.

Spraying has been held to a minimum due to the dry weather and weakened condition of trees. Purple mite, rust mite and six-spot are quite active at this time.

The summer application of fertilizer will start early in May.

SOUTH POLK, HIGHLANDS, HARDEE, DeSOTO AND SARASOTA COUNTIES

C. R. Wingfield

Information from this area could be given in very few words: "It is still awfully dry and the winds are still blowing." There have been times we thought we could not help but get a shower but up jumps the winds and away it goes. On April 10th we had what looked like a good rain but when it was all over it was only one inch in most places. As one grower has said he received one inch of rain and the next day he had four inches of wind. Irrigation plants are going at full speed and where we can hold a little moisture we are going to set a crop but there are so many growers without ample facilities, some without any at all, and it has become serious. These have lost both foliage and fruit.

While it is time to start the summer fertilizer application the grower is hoping for a rain before starting. Plans are being made to start soon even if it has to be watered in. Generally speaking the crop so far looks very light altho some groves will set a good crop and will hold it if the water holds out. Much of the fruit will be scarred due to damage from winds.

Vegetable growers have had a hard time also in getting a crop made.

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Uncle Bill Says:

Some smart gent a long time ago said: "it's always darkest before the dawn" . . . and there's a heap of us citrus folks who can vouch fer the truth of this bit of wisdom . . . about three weeks ago the drouth over the citrus area and most of the rest of the state was so durn bad that the Associated Press wrote featured stories tellin' how the long dry spell we was havin' was the worst in 65 years . . . and how citrus trees was dyin' and unless some rain came right soon the industry was in fer the worst lickin' it had had since the Big Freeze.

Then in the issue of The Tampa Tribune of April 11 headlines said that the rains of a day or two before had saved an \$80,000,000 citrus crop and that melon plantings and pastures had benefited in the same proportion . . . 'course we ain't had all the rain we want and need by a whole heap but what we had shore helped us out of a mighty bad hole . . . so we say again that the feller who thought up that sayin' about it bein' darkest before the dawn knew what he was talkin' about.

And it's often like that in a lot of other things than the rain we need . . . sometimes we git way down in the dumps as a result of things not goin' the way we want 'em, but usually if we'll stick by our guns the sun comes out and makes things look a lot brighter.

They is a tendency on the part of a lot of us folks to look on the dark side of things quicker'n we do on the bright side . . . but that is jist sort of human we guess . . . and even when politics and international affairs and strikes and storms and sickness seem to plague an awful lot of people we can well remember that things like that has been goin' on fer a long, long time and on an average the most of us ain't doin' too bad.

Which is a gob of philosophizing fer an old guy like me, but it realy ain't bad doctrine . . . so if we'll try to look fer the bright spots and use Lyons Fertilizers on our Crops we'll find we've got a mighty good chance of reapin' the best harvest possible.

Use Of Dowicide A On Citrus Fruits Approved By Food And Drug Adm.

According to the Federal Register, the Food and Drug Administration has cleared the use of sodium o-phenylphenate (chemical name for Dowicide A) on citrus fruits. The Register for February 21, 1956, stated:

"A tolerance of 10 parts per million is established for residues of sodium o-phenylphenate, calculated as o-phenylphenol, in or on the following citrus fruits: oranges, lemons, grapefruit, tangerines, limes, tangelos, citrus citron, kumquat."

This should mean much to the citrus industry since Dowicide A is the main constituent of the Dowicide A-Hexamine treatment for the post-harvest control of stem-end rot and mold decay. This treatment, developed jointly by the Florida Citrus Commission and the Florida Citrus Experiment Station, has been thoroughly tested over a period of years by Dr. E. F. Hopkins and K. W. Loucks. The process, covered by U. S. Patent No. 2,674,537 granted to these workers, is available to Florida packers without charge.

The Dowicide A-Hexamine treatment which is now well known to fruit packers as "Dow-Hex" is believed to be the first post-harvest treatment for citrus fruits for which a tolerance has been established under the so-called "Miller Act." In tests under varied and often severe conditions, the method has proven very effective and reliable in reducing the large amount of spoilage to which

citrus fruits are subject. For example decay in oranges may be reduced 85 percent or more by treatment with Dowicide A-Hexamine. Packinghouses in Florida and elsewhere have found the method to be of great value in the marketing of their fruit.

The establishment of this tolerance means that the customary use of the treatment on citrus is safe. Chemical analyses of fruit treated with Dowicide A-Hexamine have shown a residue of only about one part per million and this is found only in the fruit peel. Therefore, this slight residue is well within the tolerance which Food and Drug officials consider ample to safeguard the health of the consumer.

The action taken by the U. S. Food and Drug Administration will be interesting news to fruit packers who have used Dowicide A-Hexamine in the past and those who are considering its use. The Dowicide A-Hexamine treatment should be of inestimable value to the citrus industry.

Lake County Citrus Survey Completed

The Florida Citrus Commission has released the results of the State Plant Board's citrus survey in Lake County, the ninth citrus belt county to be covered in the Board's survey project started early this year.

In cooperation with the State Plant Board, the Citrus Commission, Florida Citrus Mutual, the U. S. and Florida Departments of Agriculture, and the Florida Agriculture Experiment Station are participating in the survey which will eventually include all counties in the Florida Citrus Belt.

The Lake County report lists a total of 5,216,447 orange trees in commercial groves, and 1,102,067 grapefruit trees in commercial groves in the county. Also listed in the report was a total of 319,425 Mandarin variety trees, 480,427 trees bearing Temple, Tangelo, and other hybrid fruits;

14,052 trees bearing Kumquats, Citrons and other miscellaneous varieties; and 34,288 acid fruit trees of which 6,753 were Persian Lime, and 7,634 trees producing Villa Franca Lemons.

Other details of the report indicated Lake County now has a total net commercial acreage in citrus of 107,922 acres; has 21,774 trees in abandoned groves; 168,366 vacancies in commercial groves; and 79,941 diseased trees throughout the county.

Other counties thus far included in the project are Polk, Pinellas, Highlands, Lee, Hendry, Collier, Broward, and Dade Counties. Including the report on Lake County, the combined totals of counties surveyed thus far indicates a total of 19,203,891 citrus trees of which 12,498,161 are bearing commercial oranges.

Net citrus acreage for the nine counties was placed at 280,767 acres; 650,137 trees were listed in the diseased category; and 236,041 trees in abandoned groves.

The citrus survey, which has been under way since early this year, will encompass an estimated 40,000,000 citrus trees when completed. The State Plant Board has indicated that it will have counted approximately 75 per cent of the total by the close of this season, and predicts that the entire survey should be completed around March next year.

Total orange trees in commercial

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groves, 5,216,447.

Total grapefruit trees in commercial groves, 1,102,067.

Total other citrus trees in commercial groves, 848,192.

Total citrus trees in commercial groves, 7,166,706.

Total dooryard and non-commercial trees, 191,874.

Total citrus trees in the county, 7,358,580.

Total abandoned trees, 21,774.

Vacancies in commercial groves, 168,366.

Diseased trees (declining and out of production,) 79,941.

Acres in commercial groves, 107,922.

QUALITY CITRUS FRUITS FOR EUROPEAN MARKETS

(Continued from page 9)

decay and an excellent general appearance because the fruit was better at the start or had been handled or refrigerated better.

Shipping tests showed that the temperature of much of the fruit was too high when loaded. Also, the ships did not have sufficient refrigeration capacity to lower it rapidly to a suitable transit temperature. Proper precooling is especially important with fruit packed in cartons because of the retarded circulation or air through the cargo of tightly stowed cartons and the insulating effect of the fiberboard.

The nonprecooled oranges loaded at New York after trucking from Florida had temperatures up to 90° when loaded. They cooled only to 59° in the vertical hold and to 41° in the refrigerated hold during the voyage. In the other shipments from Florida temperatures ranged from 35° to 74° at loading; from 33° to 59° at unloading after 12 to 14 days in transit. The average reduction in temperature after loading on the ship was only about 5° in 12 days.

In the first 2 California shipping tests, when the fruit was about 65° at loading, an average of 19½ days was required to lower the temperature to about 40°. These oranges were not precooled. Some of them were on the dock 4 days before loading. In the fifth shipping test the oranges were transported to the dock in preiced cars. Unfortunately, most of the cars ran short of ice during the 5 or more days of delay at shipside. Temperatures averaged about 77° at loading and were still 41° to 54° on arrival at destination — a condition favorable to decay in some lots of fruit.

Some of the Florida grapefruit was injured by low temperature pitting when it arrived in Europe.

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